

IT 2008 Division Self Assessment ES&H Performance Measures (period ending 9/30/08)

2008 Overview of IT Response to Self-Assessment

As stated in the IT ISM Plan:

The IT Division will conduct all of its operations in a manner that protects the health and safety of its personnel/staff, including employees, participating guests, contractors, vendors, students and visitors, does not endanger the environment, and is consistent with all applicable LBNL, university, and government agency policies and regulations.

Attached you will find the Information Technology (IT) Division's response to this year's EH&S Performance Measures. Our most outstanding accomplishments in FY08 were:

1. Our aggressive and proactive approach to the JHA rollout and implementation in the division. IT was the first division to reach 100% compliance.
2. Energy efficiency efforts in 50B-1275 computer room.
3. Ongoing ergonomic efforts resulting in only one recordable injury this year.

Through our self-assessment this year we identified a few significant areas for improvement:

1. Provide consistent and regular communication including statistics, injuries and walk around findings.
2. Update the IT ISM addressing LOTO, HMS review, Memorandums of Understanding (MOUs) for matrixed staff, walk around process and goal, and EH&S 27 for line management.
3. Improve walk arounds addressing staff coverage and telco closets.
4. Clarify guest, contractor and visiting worker safety requirements and how to track them especially for those here less than 30 days annually.

We also noted that while the tools used to track safety data over the past year have improved tremendously, there are still areas of improvement needed in both queries and communication:

1. For issues tracked in both the Ergo Database and CATS, it would be helpful if the laboratory looked into expanding the queries to easily and accurately gather statistics for reporting purposes.
2. To enable divisions to better meet laboratory objectives, EH&S initiatives need to be communicated to all levels of line and safety management, and rollout of the initiatives needs to be staggered.



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I. Introduction

LBNL's Division EH&S Self-Assessment Program provides the mechanism for assuring that Integrated Safety Management (ISM) is fully implemented and effective at all levels of Laboratory activities and operations. The Division EH&S Self-Assessment Program is a formal, internal process used to evaluate EH&S programs, policies, and processes. The process is designed to ensure that Laboratory work is conducted safely and with minimal adverse effects to workers (employees, participating guests, and subcontractors), the public, and the environment. For reference, [PUB-3105 Division EH&S Self-Assessment Manual](#) describes how the Lab administers the Division Self-Assessment Program.

II. Performance Measures

ISM CORE FUNCTION 1: DEFINE WORK

1. **Division revises division ISM plan to reflect a) EH&S policy changes (including Work Lead responsibilities), and b) updates to the Institutional ISM plan. Line management communicates updates to the plan to division personnel.**

In September 2008, IT updated its divisional ISM to reflect the changes made to the Institutional ISM plan and PUB-3000. Changes were made to redefine line management to include "work leads", and to include an annual review of work performed by division personnel and associated hazards and controls. Additionally, to address a FY07 self assessment finding, the divisional ISM was updated to explicitly state line management responsibility to conduct quarterly walk arounds. Management sent out a level 1 email to the division noting the updated ISM and its location on the IT Staff website. In the following week, roughly 25% of the division employees accessed the updated version. This shows that email communication alone does not reach IT staff; in FY09, the IT Safety Committee will review IT's safety communications to determine effectiveness and any improvement needed.

In addition to the above email regarding ISM, one of our quarterly walk arounds focused on educating staff about the IT ISM plan through a short list of questions.

2. **Per the Lab-wide implementation schedule, division ensures workers have a current Individual Baseline Job Hazards Analysis (JHA), authorizing regular and routine work that he/she performs, and if necessary one or more current Task-**



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based JHA(s) to authorize unpredictable, short-term, or unusual work that is not included in the Individual Baseline JHA.

Division Director Alvarez sent email on July 9, 2008 setting an aggressive internal JHA deadline of July 17, 2008. While IT was able to initially hit 100% JHA compliance, we quickly learned how dependent our statistics were on the status of temporary guest workers. In FY09, we will review our processes to determine whether these temporary workers should be classified as Laboratory "guests" and complete the JHA process, whether work authorizations for these workers should be handled through the Non-Construction Subcontractor JHA process, or whether some other solution yet to be identified should be implemented. Additionally, we will review existing contracts to ensure safety agreements are formally documented as appropriate.

IT did not implement any task based JHAs this performance period. Task based JHAs are an issue to be addressed by the laboratory at large in the coming performance year. The JHA team has suggested that this may not affect the IT division, but we will still review the use of task based JHAs and validate that this is the case.

The JHA process is documented in the IT ISM Plan, including requirements for staff to take or update the JHA annually (or when responsibilities change), for the IT Safety Committee to review the list of work groups annually, for Work Group Owners to update hazards and controls annually, and for staff to follow ESH requirements and complete training as identified by JHA.

ISM CORE FUNCTION 2: IDENTIFY HAZARDS

- 3. Division reviews work activities to identify, analyze, and categorize hazards and environmental impacts for the associated work. Examples of hazard inventory include: Hazard Management System (HMS) database (or equivalent), project safety review, workspace safety review, Job Hazard Analyses (JHA), environmental review (NEPA/CEQA), and chemical inventory.**

The IT division inventories its hazards in 3 ways: in HMS, through the JHA process, and during workspace walk arounds.

This performance period, the Division Safety Coordinator inventoried hazards in known spaces and ensured those hazards rising to the level to be recorded in HMS were entered accordingly (e.g. fire suppressant systems in computer rooms). In FY09, the ISM will be updated to reflect the requirement for an annual review of the HMS database.

IT implemented the JHA process this performance period. All employees are expected to update their JHA annually, and whenever their responsibilities change. The IT Safety



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Committee will review the list of work groups annually, and the Work Group Owners will update hazards and controls annually. This process is described in the IT ISM plan.

Finally, IT conducts quarterly walkarounds as required in the IT ISM plan. For FY08 89% of all staff received at least one walk through review. For FY09 IT will set the goal of at least 90% of staff being reviewed at least once during the four annual quarterly walkarounds. In the past, the work spaces to be walked through have been identified through HRIS, key plans, and the telephone directory. In September of this year we were advised to contact Facilities as they could produce a list of IT space. This brought to our attention that the IT division is considered responsible for all telephone closets on the hill. In FY09, IT will work to incorporate the identification and review of all telco closets on site into its walk around plans. Additionally, it was noted that there were a number of erroneous spaces that were listed as belonging to IT. In FY09, IT will work with Facilities to clean up incorrect data in the Facilities database.

4. Division participates in pollution prevention, energy conservation, recycling, and waste minimization programs, as appropriate for the environmental impact of their activities.

During FY08, the IT Division embarked on a project to increase the energy efficiency of its primary data center, 50B-1275. Working in collaboration with researchers in the Environmental Energy and Technologies Division, as well as the Facilities Division, IT engaged several consulting engineers to study the electrical, mechanical, and air flow characteristics of the data center space, and to offer recommendations for improvement. The Division has already converted the overhead cold air supply to a hot air return plenum; has added duct work to connect the data center air conditioners to the new return plenum; has eliminated wasteful and unnecessary humidification and dehumidification systems; and has installed a wireless environmental monitoring system to measure temperature, humidity, electrical current, and under-floor air pressure in the data center space. The monitoring system allows data center operators to obtain real-time, visual feedback in response to physical changes in the room. With the assistance of the monitoring system, operators have removed and relocated dozens of air-permeable floor tiles to eliminate 'hot spots,' to reduce over-cooling, and to increase under-floor air pressure. Operators have actually turned off one 15-ton air conditioning unit, and have increased the temperature set point on the others. In addition, IT is working to virtualize servers with the aim of reducing space and electrical requirements. Finally, IT is installing the necessary plumbing and control systems to bring water-cooling technology to a limited number of compute cluster systems in the coming months.

Other activities undertaken in IT included advising administrative staff to purchase recycled paper for copiers and printers and to use double-sided functionality on both copiers and printers when possible. The division continues to actively recycle paper and default to sharing documents electronically.



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ISM CORE FUNCTION 3: CONTROL HAZARDS

5. Division ensures appropriate engineering and other safety/environmental controls are in place and properly maintained.

Examples of controls include, but are not limited to:

- **Guards, barriers and shields**
- **Fume hoods, glove boxes, biosafety cabinets**
- **Interlocks**
- **Exhaust system filtration**
- **Secondary spill containment**
- **Personal protective equipment**
- **In-lab alarm monitors**
- **Stack emission monitors**
- **Lockout/tagout**
- **Ergonomic workstation modifications (furniture, equipment and/or accessories)**
- **Manual material handling lift assist devices**
- **Cranes and hoists**

The IT Division's main hazards continue to be ergonomic in nature. Mitigations taken over the past two years include but are not limited to: ergonomic evaluations for new employees and employees with discomfort, annual Remedy online ergonomic self (OES) assessment, and walk arounds with continued communication regarding early reporting of any discomfort. Additionally, IT actively pursued purchasing adjustable desks for employees where justified to mitigate ergonomic issues and provide flexibility in the future. Where equipment or large numbers of documents need to be lifted (e.g. archives and records and the computer rooms), IT procured lift-assist devices, supplying training as necessary. These steps have helped reduce the number of ergonomic recordable injuries in the past year from three to one. The number of ergonomic first aids is relatively unchanged. Based on growing concern for the safety of our telecommuters, in FY09 IT will be collaborating with EH&S to pilot a Remedy OES for telecommuters.

The majority of IT staff do not work with LOTO. The one exception is in the Computing and Communications Facilities Group where IT employees and subcontractors are trained and may perform LOTO work on the following:

1. Cranes in high bay areas to prevent movement over work areas.
2. Electrical circuits which are shut off by a LOTO-trained Lab electrician and worked on by LOTO-trained IT staff.

Additionally, any subcontractors working on electrical equipment (e.g. UPS systems) are required to submit safety plans as well as proof of LOTO training. All current subcontractors have reviewed and follow LBNL LOTO policies.



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It is the standard operating procedure within IT that any work that involves hazardous energies is reviewed by an EH&S electrical representative.

In FY09 IT will be reviewing all LOTO or potential LOTO issues in and formalize process in our Divisional ISM as appropriate.

- 6. Division ensures administrative controls are in place and maintained. Examples of administrative controls include: work authorizations (including but not limited to JHAs, AHDs, BUAs and RWAs), work permits (including but not limited to confined space, and energized electrical work), environmental permits, work procedures, and project safety reviews.**

Thanks to an aggressive internal deadline set by Division Director Alvarez, the IT Division was the first division to reach 100% compliance on JHA completion. Per the divisional ISM plan, all IT staff are required to take the JHA annually, or when responsibilities change. In FY09, the IT Safety Committee will review the list of work groups, and Work Group Owners will update hazards and controls.

IT follows ESH entry requirements for confined space. To address a FY07 self assessment process improvement, as of June 2008, IT now internally logs and tracks confined space permits. A copy is kept with the Division Safety Coordinator, and the original is submitted to ESH, per ESH requirement. Work procedures for confined space are noted again this year in the Appendix A. A recent occurrence (09/20/08) in which a meter alarm was triggered in a confined space was noted in the permit. The investigation will conclude in FY09.

In September of 2008, IT adopted the Subcontractor Job Hazard Analysis for non-construction work. This was used twice in our division prior to roll-out. In FY09, IT will review all contracts to ensure safety compliance is formally documented.

- 7. Division ensures that ergonomic hazards (computer, laboratory, and material handling) are adequately controlled and that employees and line management are knowledgeable and engaged in this process, including the early reporting of ergonomic pain or discomfort (before an injury).
Ergonomic issues/concerns/discomfort/pain are reported promptly for appropriate corrective action.**

As described in the divisional ISM, IT implements ergonomic safety controls. (See response to question 5) IT has a 98% completion rate for EHS010 10 with the three individuals out of compliance all "guests". IT has a 99% completion rate for EHS058 AND EHS059 Remedy OES.



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Following our division-wide effort in piloting and providing feedback for Remedy OES in FY07 and FY08, EH&S has now fully developed the tool and rolled it out to the laboratory at large.

For the FY08 performance year, 63 ergonomic evaluations were requested, either as a result of new employee status, discomfort, or other employee concern, for 44 unique employees. Of the 63, 58 were performed, and 5 were cancelled. Of the 58, 46 have been closed out (ergonomic evaluations completed and any corrective actions completed), 12 are still in process.

For ergonomic issues tracked in the Ergo Database, it would be helpful if the laboratory looked into expanding the queries in the database so that statistics regarding timeliness of ergonomic evaluations and timeliness of implementation of corrective actions can be easily and accurately delivered for reporting purposes.

IT has 2 active participants in the ergo advocate program who have helped to mitigate injuries by performing ergo evaluations. One of the ergo advocates is located in 937 and one in B50 complex. This proximity to our staff both on and off the "hill" has allowed the ergo advocates to effectively respond to requests in a timely manner. IT ergo advocates address obvious issues and escalate more difficult situations (e.g., discomfort) to the Ergonomics Program.

Additionally, to handle ergonomics issues related to material handling, at the end of FY08 IT procured lift-assist devices for installing equipment into racks in computer rooms. Relevant training for using these lift-assist devices will be provided in FY09.

ISM CORE FUNCTION 4: PERFORM WORK

- 8. Work is performed within the EH&S conditions and requirements specified by Lab policies and procedures. Performance criteria include work authorizations (including but not limited to JHAs, AHDs, BUAs, RWAs); work permits (including but not limited to confined space, energized electrical work); waste management criteria (SAAs, waste sampling, NCARs); and environmental permits and management criteria (resource conservation, pollution prevention and waste minimization).**

Confined space entries are performed per requirements of EH&S through the confined space program. Staff follow strict procedures performing this work as outlined in Appendix A. The work lead discusses safety with workers in project meetings as needed as well in weekly staff meetings, and the work lead conducts regular projects walks arounds during the duration of the project to check project status and ensure procedures are being followed.



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The JHA represents another work authorization. All IT staff are required to take the JHA annually, or when responsibilities change. Supervisors meet with staff to discuss the JHA, how to perform work safely, and assure required training is completed. Supervisors, work leads, and managers review work performance via both formal (i.e. quarterly) and informal unannounced walk arounds. Safety is also discussed in various staff meetings conducted on regular basis. We have received recent feedback from IT Safety Committee that the emphasis of safety by supervisors varies, and IT will work in FY09 to understand this further and address any issue.

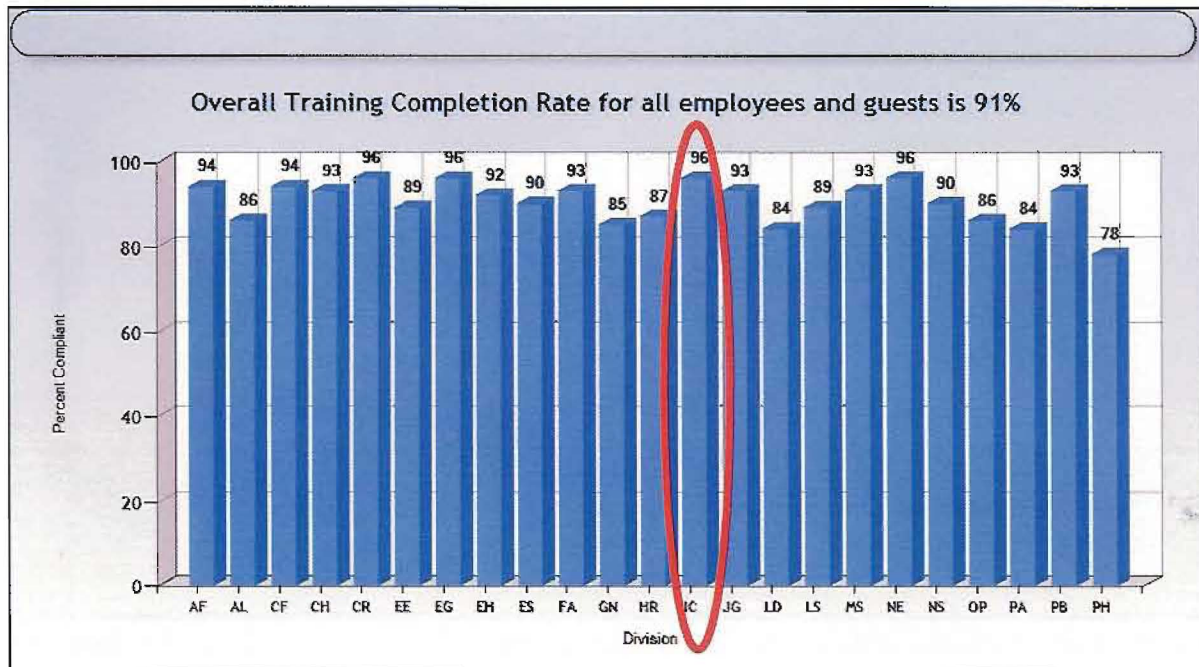
9. Staff (including employees, participating guests, students and visitors) are properly trained

IT JHA compliance is at 100%. Due to Division Director Alvarez setting an aggressive internal deadline, IT Division was the first division to reach 100% compliance.



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IT is at 96% training completion as of 9/30/08.



ISM CORE FUNCTION 5: FEEDBACK AND IMPROVEMENT

- 10. Division implements an effective safety walkaround program per the requirements of the Division ISM Plan. Ensure all personnel required to perform safety walkarounds, as defined in the Division ISM Plan, have completed EH&S 27 Performing an Effective Safety Walkaround.**

IT performed quarterly walk arounds per the divisional ISM. To avoid merely focusing on deficiencies during walk arounds, we have decided that three of the four annual walk arounds will focus on a particular theme. This year, the 3 quarterly themes were: 1) the IT ISM plan, 2) Remedy Online Ergo Self-Assessment along with emergency (i.e. earthquake) status contact number, and 3) the JHA process. In each case, the supervisors were given 3 to 4 points, or questions, to explore with their employees during the walk-around. The final walk around was conducted by the division director and/or deputy, division safety coordinator, and line management and included all staff office and workspaces. Occasionally a BSO representative, the Building 50 Facility Manager, or IT's EH&S Liaison participated as well.

Results from the walk arounds that are not corrected on the spot are submitted to the Division Safety Coordinator (DSC). These results are reviewed by the DSC and entered into the ergo



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database, Corrective Actions Tracking System (CATS) or work request center, as appropriate. In FY09, the divisional ISM will be updated to reflect this practice.

IT collaborated with EH&S to pilot EH&S 27 at a supervisors meeting held on 9/8/06. IT had not followed up on this training for all staff conducting walk arounds. As of 9/30/08, 68% of staff who do perform walk arounds have taken the course.

This course was not a requirement in this performance year in our ISM. When we realized this, we notified EH&S and requested that it be added to the JHA. In FY09, we will modify our divisional ISM to include this requirement and assure staff have taken training.

- 11. Division performs a thorough review of all accidents, injuries, incidents, near misses and concerns according to Lab policy and the division's ISM plan. Corrective actions to prevent recurrence are identified, effectively implemented, and shared via the Lab's Lessons Learned and Best Practices database, as appropriate.**

As detailed in our ISM Plan, IT conducts a formal incident analysis on all recordable injuries. This process was followed for our single recordable injury this year.

	Recordable Injuries		First Aids		Total SAARS
	Ergo	Non-ergo	Ergo	Non-ergo	
FY07	3	0	5	5	13
FY08	1	0	4	4	9

All recordable injuries over the last two years have been ergonomic in nature. IT improved in number of recordables and overall performance.

In FY07, one first aid became a recordable. In FY08, no first aids became recordable. At first glance, it appears that our corrective actions have been successful at preventing these first aids from becoming recordable, but FY09 data will need to be considered before declaring this with certainty.

Regarding the single recordable injury in FY08, the injury was originally reported to medical as a non-work related injury and therefore was not logged as a first aid. When the injury progressed and became recordable, the employee then stated it was work related. The investigation was inconclusive regarding at what point this injury became work related, so it is difficult to determine whether we could have done a better job at catching this issue early and preventing a recordable.

IT experienced a near miss incident in late September 2008 that involved a melted power receptacle. It appears that a power distribution unit (PDU), with multiple devices were



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plugged in, overheated, but the circuit in the computer room did not trip. The initial finding was that multiple pieces of equipment exceeding the permissible "continuous load" were plugged into the PDU. The immediate problem has been remedied. In FY09, we will determine how best to put controls in place to avoid this problem in the future and communicate these new requirements to the necessary audience. We are also working with EH&S Electrical Safety to try to discern why the circuit did not trip. Once the investigation is concluded, we will follow-up with appropriate reporting and log a lessons learned.

- 12. EH&S deficiencies that cannot be resolved upon discovery are entered in CATS in a timely manner and tracked to resolution. Deficiencies include those from workspace inspections, self-assessment activities, SAARs, Occurrence Reports, Non-compliance Tracking System Reports, environmental inspections, Division Self-Assessment, EH&S technical reviews, Management of EH&S (MESH) Reviews, and external appraisals.**

EH&S deficiencies not corrected on the spot or tracked in the ergo database are entered and tracked in CATS. The Division Safety Coordinator (DSC) enters and tracks status of divisional corrective actions to ensure follow-up and completion. When items are entered into CATS, the DSC identifies line management as an approver so that they are notified of the item entry into CATS and completion. As of 9/30/08, IT CATS completion rate is 97%. One of the open CATS items (Building 46 ventilation) is pending completion and closure. The remainder of the open CATS items are completed but pending closure in the database.

For CATS issues, it would be helpful if the laboratory looked into expanding the queries in the database so that statistics regarding timeliness of closure and timeliness of implementation of corrective actions can be easily and accurately delivered for reporting purposes.

FY07 Findings and Response:

- *The validation noted that the IT Division ISM Plan does not describe line management responsibilities for walk arounds, as required by LBNL ISM Plan section 1.4.5.2.*

This has been rectified in the latest IT ISM Plan as noted above in response to ISM Core Function 1: Define Work (Measure 1).

Divisional Process Improvements

- *Building additional awareness and ownership of ISM principles (e.g. checklist, safety resources, training) within the division*

IT did this via walkthrough and divisional communication as noted above in response to ISM Core Function 1: Define Work (Measure 1)



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- *Formalizing, documenting, and implementing the divisional hazard review process*

IT updated the ISM to address JHA Work Groups, associated hazards and mitigation, and walk arounds to detect hazards. The ISM will be updated in FY09 to document the existing practice for collecting walk through forms and ensuring closure of issues identified, as well as to reflect the requirement for annual review of the HMS database. This is noted above in response to ISM Core Function 2: Identify Hazards (Measure 3) and ISM Core Function 5: Feedback and Improvement (Measure 10).

- *Implement identified energy conservation and pollution prevention initiatives*

IT embarked on a project to increase energy efficiency of its primary data center. Since this project was of higher priority, only some of the initially identified initiatives were implemented. This is noted above in response to ISM Core Function 2: Identify Hazards (Measure 4).

- *Review internal logging and tracking of confined space permits*

As of June 2008, the Division Safety Coordinator retains copies of confined space documents for division record. This is noted above in response to ISM Core Function 3: Control Hazards (Measure 6).

- *Review MOU's for matrixed staff*

While some progress was made, including identifying matrixed staff and assessing current agreements and practices regarding safety responsibilities, formal MOUs were not completed. This will be completed in FY09.



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- Appendix A Confined Space process for IT entry into communication manholes

Areas with confined space hazards or other unusual work activities are covered by Lab policy.
Confined Space Process:

- A. Get proper LBNL confined space training
 1. Basic Confined Space Entry Class
 2. Confined Space Permit Writer's Class
 3. First-Aid
 4. CPR
- B. Gather all safety gear for confined space work
 1. Full-body harness
 2. Life-line
 3. Rescue tripod, with winch
 4. Gas meter
 5. electric, ventilation fan, with hoses
 6. bilge pump
 7. Cones, rope, caution tape, or barricades to alert others of open man-hole, and prevent accidental falls/trips into man-hole
 8. Tools for entry: crow-bars, man-hole cover cam-lifter
 9. PPE: safety shoes, gloves, long pants, and in some cases; hard-hat, and protective eyewear
 10. Confined-space permits, pen
- C. Once you are ready to open a manhole the steps are as follows:
 1. Put on Safety shoes, and gloves
 2. Barricade off the man-hole area
 3. Ensure that there are, at least, two qualified people at site
 4. remove the man-hole cover with approved method
 5. Turn on, and self-test gas meter
 6. Lower gas meter into hole, testing at three levels: bottom, middle space, and near the entrance
 7. Fill out permit, filling in all information, and checking applicable boxes
 8. Write down "start time" and sign permit
 9. Permit MUST be signed by trained Permit writer only
 10. Pump out water, and ventilate space with fan, if needed
 11. Either test air with gas meter continuously, or at fifteen minute increments
 12. Post permit, clearly at site, so it is in clear view for passers-by
- D. To enter confined Space:
 1. Discuss safety plan, and emergency procedures
 2. Person entering must have full-body harness properly put on, and checked by the space attendant (aka: safety or fire watch)
 3. Attach life-line to pulling ring of the full-body harness
 4. Attach other end of life-line to the rescue tripod
 5. Confined space worker can now enter space
 6. Attendant has to watch, and stay at space the entire time worker is in the hole
 7. If attendant has to leave for any reason, then the worker must come out of space before the attendant leaves
 8. Complete work, and leave confined space
- E. Close man-hole cover, and write down "end time" on permit
- F. Gather all permits for that week up, and deliver them to the Lab's EH&S Confined Space Manager's office at end of the week.

